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ORIGINAL SKETCHES OF BRITISH BIRDS.

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The Mistle-Thrush (*Turdus viscivorus*).

The song of the Mistle-Thrush has an indescribable charm for most lovers of birds, and, it may be added, not without reason. Heard at a time of the year when the afternoons are visibly lengthening out, and our thoughts are attuned to the coming of spring, the associations connected with it doubtless tend to a pleasing influence upon the listener apart from any actual merit contained in the song itself, which, to my mind, is considerable.

The melody, however, is somewhat curtailed, no matter whether poured forth in storm or in sunshine, with a distinct kind of curl in it, resembling not a little the wild notes of the Ring-Ouzel. I do not know if others have remarked this peculiarity in the song to which I have alluded, and which it is quite possible may be considered a very indifferent definition of what it is my wish to convey; nevertheless, this curious intonation, which I have attempted to describe by the term "curl," is distinctly present.

It has been stated with a show of authority that Mistle-Thrushes are not gregarious, but that they consort in families; the fact remains, however, that Mistle-Thrushes are to be seen associating in considerable numbers in the month of September every year. Now I must say at the outset that I am far from wishing to criticize the observations and experiences of others,

when irreconcilable with my own, in a harsh or captious manner, for I am by no means insensible of the heavy debt ornithologists of every degree owe to the writings of their predecessors; nevertheless, the *truth* is, or should be, the common object of all who write sketches of bird-life.

Many a time in the spring of the year, when I have been waiting and watching in some plantation or wood in order to watch a Sparrow-Hawk to its selected nest, old nests of years gone by being in almost every tree, have I been indebted to the far less harmonious, not to say angry and objurgatory, notes of the Mistle-Thrush at a distance for warning to pull myself together and be on the alert; while a moment or so later, swiftly and silently winging its flight amidst the trees, has the special object of my ramble appeared, shooting up at last to its perch upon a branch, and remaining perfectly motionless while eventually affording me—provided my ambush had told no tales—the identical piece of information I was in want of. In defence of its nest the Mistle-Thrush is very courageous, but still more so in defence of its young when on the point of quitting it; I have observed some battles royal on the part of this bird with Rooks and Jackdaws, and, though successful on occasions in fraudulently appropriating the eggs, I have never seen the two species just mentioned actually capture the young.

I have good reasons for considering this bird a very early breeder. I have never detected its nest in abnormal situations, nor have I come across abnormal eggs, either as regards colour, shape, or size, as has been the case with sundry other birds; but a most singular instance respecting the nesting of this species came under my notice in the spring of 1883. In May of that year there were two Mistle-Thrushes' nests built low down in ornamental yew trees, within half a dozen yards of each other, opposite the hall-door of a country house in Leicestershire. Both nests contained eggs when I found them, and in each instance broods were successfully reared. Some few days after all the young ones had flown, I was rather surprised to notice an old bird again on one of the nests, and, on inspecting it, I was a great deal more surprised to find that it contained no fewer than nine eggs, five being of the type of those originally laid in it, and the remaining four evidently the property of the Mistle-Thrush

that had built and utilized the nest in the adjoining tree. I took four of the nine eggs away, and the old bird incubated the remainder, and in the course of time brought forth a second brood. Meanwhile the other Mistle-Thrush had constructed a second nest a short distance off, and she too was successful in hatching out a second brood. I should add that the eggs in the two nests in the first instance presented very distinctive features, so the absolute accuracy of what I have related need not for one moment be called in question. The Curator of the Leicester Museum and others were acquainted with this interesting case at the time.

The year following (1884) only one nest was built; I found it on March 24th, some six weeks earlier than in 1883, when the two nests had been built in May, altogether a late date, except on the hypothesis that it was a case of second nesting, which seems probable. The nest was placed in pretty much the same spot in 1884; it contained seven eggs, all fresh, and an old bird was brooding them when I discovered it. Of the seven eggs, four were of one size, shape, and colouring, and three of another, and both lots corresponded with the character and were beyond all doubt referable to the two types of the eggs laid in the preceding year. It may be hazardous to theorize on the subject, but I have a theory, and it is this—that the two hen birds shared a mate between them. In the one instance the eggs were small and round, while in the other they were rather elongated, the ground colour, moreover, as also the markings, varying with each type. Having kept specimens of each in 1883, I naturally compared them with those laid in 1884, and there can be no sort of doubt but that they were the produce of the same two birds.

With regard to this species, I do not remember having met with anything else in their economy or life-history that need be reproduced here. Their conspicuous nests, built early in the spring of the year, and containing, as a rule, four or five eggs, are known to most schoolboys; but when I come to deal with the Lapwing, I shall relate what I have every reason for believing was a second instance of a single male bird aiding and abetting the nidification of two females. Polygamy is natural to some species, but Mistle-Thrushes and Lapwings do not come within the category. Of course, I am far from contending that the accuracy

of my theory is absolutely proven, though it satisfies my own convictions.

With the advance of summer, and after the young are fledged, the Mistle-Thrush's utterance is chiefly limited to a harsh monosyllabic note sounding like *wark*, repeated at intervals. People have often asked me what it was, and not always believed me when I have told them. Some have fancied it to be the croak of a Frog.

Without undue presumption, I think I may claim to have found a Mistle-Thrush's nest so charmingly situated as to have been simply peerless in the natural beauty of its immediate surroundings. A huge bunch of mistletoe hung for many years from one of the middle branches of a lofty poplar at the four cross-roads between Lucton School and Mortimer's Cross, in Herefordshire, and in the centre of this bunch a pair of Mistle-Thrushes one spring built their nest and reared their young. Subsequently an enterprising boy climbed the tree just previously to the Christmas holidays, and possessed himself of the mistletoe in its entirety, which doubtless he put to much less profitable use when it adorned the interior of his own home than had been the case with the striking-looking birds that had once employed it as a nesting site during the month of sunshine and showers.

There is a prevailing notion that Mistle-Thrushes are silent after April has run its course. This may be true of the majority, but one of the species most certainly sang to me almost daily during the first three weeks of May in 1894. There are, I may perhaps observe, many hard-and-fast notions about the history and economy of birds which are wholly erroneous, but which are possibly to be condoned from the fact that they are so often repeated, and therefore fostered, by so-called popular writers on Natural History. Original observations are what we want nowadays; how seldom, comparatively speaking, do we get them where birds are concerned!

The Song-Thrush (*Turdus musicus*).

Of so generally abundant and well-known a species throughout the British Islands I have not very much to say that has not been said scores of times already, and therefore my remarks on this delightful songster will be discreetly and advantageously

curtailed. Its nest is to be found in varying and odd situations, and in the spring of 1894 I noticed, during a long visit to North Wales, chiefly for ornithological purposes, that a very favourite site for it was not only on but *in* banks. I was staying at Llanuwchllyn, a village prettily situated near the southern shore of Bala Lake, and it was almost impossible for anyone who possesses a keen eye for birds' nests to stroll along the charming lanes thereabouts without remarking those of Song-Thrushes so located. Children journeying to and from school twice a day along these lanes made sad havoc of all kinds of nests, but it struck me that the poor confiding Song-Thrushes fared the worst at their hands, not even excepting Blackbirds and Robin Redbreasts. The wantonness with which nests were torn from their picturesque sites, and the eggs flung broken on the ground, fairly made my blood boil on many an occasion; while I ascertained that the little girls were every whit as bad as the boys. If masters and mistresses of village schools throughout the kingdom —for I have little reason to doubt that the wantonness complained of is pretty general—would take upon themselves to impress on the youthful mind the cruelty involved in robbing birds' nests wholesale without any set or scientific purpose, and would further impress the moral by a little salutary correction on the youthful bodies of hardened offenders, the result would be far more conducive to the peace and happiness of the birds themselves, and infinitely less harrowing to the feelings of those who from a genuine and deep-rooted love of their subject make the avifauna of these islands the all-engrossing study of a lifetime.

That some such restrictions in the matter would not be without general and good effect is shown, I think, by a visit I once paid to the Bempton cliffs, on the Yorkshire coast—between Bridlington and Filey—in order to watch the gathering of the Common Guillemots' eggs, and make a selection of quaintly-marked and uncommon specimens for my own collection. On this occasion I was accompanied by my wife, who takes as keen a delight in birdsnesting as myself, and is wonderfully "smart" at finding eggs; and as we walked along the main road from Bempton station to the cliffs, we noticed several nests of different species, containing eggs, in most exposed situations, and were, moreover, not a little struck by the fact that the children we

passed were busily engaged picking the wayside flowers. There is more in this than meets the eye, I thought; so we stopped and asked an intelligent-looking boy of apparently some eight or nine years of age if he or his companions ever meddled with the birds' nests. Quick as possible came back the answer, "Oh, no; we're not allowed to." And on further investigation I rejoiced to find that such was absolutely the case, the children in the village schools thereabouts being very rightly taught the cruelty of an indiscriminate and irrational destruction of birds' nests and eggs.

This species is an indefatigable songster, and probably if it were less frequently heard in our gardens and orchards, we should set greater store by its music—regard its varied and stirring notes with greater favour. I have heard it sing every month in the year at such times as the weather has been mild and open. I heard one give forth a few sweet notes at a quarter to eight on two consecutive mornings in the first week in January in the year 1888, and another bird sang almost every day in my garden throughout the November of 1893. As is the case with most of our feathered songsters, however, the weather plays an all-important part in the "to be or not to be" question of an open-air vernal concert; nevertheless, the Mistle-Thrush must be quoted as a notable exception to this rule, and as one not to be deterred by storms and gales from chanting its pleasing lay. Alike in fair weather and foul, and at its appointed season, the "Stormcock" raises its voice, perched aloft amidst the topmost branches—rather preferring, I have observed, to station itself in an isolated tree either by the roadside or in a hedgerow a field away for the purpose.

The Song-Thrush is a more or less migratory species; it pairs early in the spring, and the nest, which is quite unique, is placed in a variety of situations; but because I once discovered one on the ground in the Rectory plantation at Skeffington is not conceived an adequate reason for suggesting that that is one of its normal situations. We talk glibly enough about the absurdity of drawing conclusions from single instances, and yet I can never get out of my head reading in some book or other intended for the instruction of simple tyros like myself that Nut-hatches' nests were to be looked for in haystacks! I can only

presume it was thought that to this grotesquely aberrant situation for a Nuthatch's nest—the original of which, by-the-by, is to be seen in the South Kensington Museum—the Latin adage *ex uno disce omnes* would most fitly apply. Let all young ornithologists be on their guard against the tendency to generalize from a single and perhaps exceptional experience. Surely I have some memory of a man who once alleged he had shot a Hare at ninety yards, and who wrote proclaiming the feat in a well-known journal devoted to records of sport, and who argued therefrom that he could always kill Hares at ninety yards! Unless I am dreaming, the gentleman with the long bow was somewhat roughly handled by subsequent critics of both his feat and logic in the same journal. The writer once dropped a Grouse dead at ninety yards—a cross shot—that had been previously "peppered"; it was a precious fluke, a stray corn just chancing to penetrate the brain; but many another has been missed at a third of the distance since. It was on the beautiful Kildonan moors, in Sutherlandshire, that the shot was made and measured.

However, the Song-Thrush is my theme. With regard to its eggs, the only abnormal-sized varieties I have met with have invariably been on the small scale. I have also found them on rare occasions unspotted, and in one instance, in Herefordshire, I took a beautiful clutch of five with blood-red markings upon them. The characteristic nest of this species is too well known to need my making any reference to it.

The Redwing (*Turdus iliacus*).

For a close inspection and prolonged study of the Redwing there is hardly a period more suitable than that of frost and snow, especially when a heavy fall of the latter has covered the ground to the depth of several inches, and the grass of the green fields has been hidden from our view for many days. Then it is that the poor birds, with their normal food supply cut short, and pinched with cold and hunger, draw to the roadside hedges for the purpose of feeding on the winter berries which, in mild open weather, they apparently set less store by, except on first arrival. During a severe spell of weather I have gone close up to as many as ten or a dozen in a low bush, their attitude crouching and despondent, and they have shown neither fear nor inclination to

be gone at my approach. There is some old saying to the effect that adversity makes strange bedfellows, and the truth of it occurred very forcibly to me when one morning a winter or so ago I found some Redwings collected in a thorn-bush by the roadside, sitting quite still, and apparently resigned to any fate that might overtake them. Noticing a dark and much larger-looking object in the same bush, and having my curiosity aroused, I went up to it, and discovered that their companion in misfortune was a Squirrel. The poor thing, tamed by hunger and cold, was as confiding as the Redwings, and seemed to be sharing their frugal fare of hips and haws.

I am of opinion, nevertheless, that this species is able to withstand the occasional severity of our winters much more readily than the Fieldfare, owing to its Thrush-like habit of frequenting, during hard frosts, hedgerow bottoms, and feeding on snails and the pupæ of Lepidoptera. Its haunts and habits somewhat resemble those of the latter bird, and it arrives in this country generally some few days in advance of its equally well-known congener. In the autumn of 1894 I saw and heard both species for the first time on the same afternoon, *viz.* October 15th. My attention was attracted to the Redwing by its familiar "wheet wheet" long before I perceived it, with a companion, perched aloft on the dead branch of a tree in a hedgerow. I oppose the doctrine that Redwings by nature are exclusively insectivorous, and only revert to berries as a last resource; on their arrival in this country they immediately set to work in small flocks on the hips and haws, though I admit that later in the year, in open weather, they may frequently be seen in the pastures feeding on worms and snails and other insects. They frequent the meadows by day, and towards the close of the afternoon, just as dusk is coming on, may be seen in little straggling parties repairing to the shelter of shrubberies and plantations, where they spend the night. The Redwing is easily distinguishable from the Song-Thrush by a broadish white stripe over the eye, in addition to which it is a bird of gregarious habits, which the other is not. As an article of food its flesh is considered very delicate—"better than the Fieldfare," I have heard a good judge of things edible declare; but this, of course, must be a matter of individual taste. Personally, I should say that a fat Blackbird in the

autumnal months, well hung and not too long before the fire, would run them both very close.

Touching the vexed point of the Redwing nesting in this country, I am aware that it has been reported to have done so —indeed, on more than one occasion in my own county—but, though such may have been the case, it is quite out of the question that the mere *ipse dixit* of, it may be, an anonymous correspondent to some paper should be accepted as authoritative on the point. Actual and absolute proof of its nest and eggs having been obtained in this country has not yet been forthcoming, I fancy, and until the birds are killed at the nest and the eggs taken, ornithologists will do well to receive with the fullest reserve all affirmative statements that have hitherto appeared on the subject. It is very easy to make an assertion ; it is another matter to prove it. The writer has frequently been girded at as being too particular in his wish for indisputable evidence on sundry points connected with birds, but he maintains that it is a subject on which one cannot possibly be too particular. Only consider for a moment what distinguished modern writers on ornithology have done with a mass of flimsy and unsupported evidence relative to the appearance of this or that rare species in this or that part of the kingdom: why, they have rejected it as utterly unreliable ; and had only a proper test been applied in the first instance to communications of the kind, ancient books on the subject of birds would have contained far less fiction.

However, to return to the Redwing. I have had its eggs from Norway, and they much resemble small varieties of those of the Blackbird, the ground colour being almost entirely hidden by tiny streaks, which are evenly distributed over the whole surface. It has a sweet pleasing twittering kind of song as I have heard it, but I am not at all sure that I have heard the real thing, for the reason supplied by the quotation from 'A Spring and Summer in Lapland.' "An Old Bushman" writes :—"Of all the northern songsters, perhaps the Redwing stands first on the list, and is with justice called the northern Nightingale, for a sweeter song I never wish to listen to." This is enthusiastic writing, which I can appreciate without, I regret, being in a position to endorse. I can never have heard the Redwing at its best.

The Fieldfare (*Turdus pilaris*).

A bird of passage, and of more than common interest. It comes to our shores in the autumn and departs in the spring; and, though British nests and eggs have been reported as taken, I believe the gravest doubt encircles all such statements. I have special reasons for remembering this bird, and I will relate why. On two occasions I have publicly recorded observations of its existence in this country at what were deemed unusual dates, and on both occasions my communications were as publicly called in question, and it was insinuated that I had blundered in my identification,—in short, had mistaken the Mistle-Thrush for the Fieldfare. That such errors are of frequent occurrence with those who do not make birds a particular study is, I freely admit, beyond question, and consequently there is no reason really why an obscure ornithologist like myself should feel hurt at the suggestion of such lamentable ignorance. All the same, the fact remains that in my own estimation I am just as likely to confuse the two species as any two letters of the alphabet.

In the first case: in 'The Vertebrate Animals of Leicestershire and Rutland' I recorded a Fieldfare's exceptionally early appearance at Lowesby on Sept. 2nd, 1877,—it should have been printed 1878,—and I am at liberty here to amplify this brief notice with a few details, though I would first like to point out that in Mr. J. E. Harting's edition of 'The Natural History of Selborne' there is reference to a Fieldfare shot in a garden near Kirby Muxloe, in Leicestershire, on July 29th, 1864, and forwarded to the editor of 'The Field' for examination. It had been observed about the garden all the summer.

With regard to the Fieldfare seen at Lowesby, however, I remember the occasion distinctly. A cheery companion and friend—alas! long gone from these scenes—and myself had just started out shooting, and we had only got a little distance beyond the plantations that fringe the lower side of the Hall, when my attention was suddenly arrested by a kind of chuckle with which I am infinitely more familiar in mid-winter than during the opening days of Partridge-shooting. The chuckle was repeated more than once, and in a twinkling I descried a Fieldfare perched high up in a lofty tree. I tried to stalk the bird, but it was far

too wary for me, and just as it took wing, it again uttered that well-known laughing cackle, somewhat more briskly this time, which I have noticed is a common habit of the species on the moment of taking flight. I admit that I was "let down," so to say, very courteously in 'The Vertebrate Animals of Leicestershire and Rutland,' but there is no getting away from the fact that my note therein is immediately followed by a reference to the Mistle-Thrush being frequently mistaken by *sportsmen* for an early arrival of the Fieldfare, so I can draw my own conclusions.

In the second case, I wrote as follows to 'The Field': "On the afternoon of Oct. 3rd I heard, saw, and could have shot (as the one closely pursued the other) two Fieldfares"; and the Editor appended the following note: "Although it would not be exceptionally early for Fieldfares to arrive, the action described points with more probability to the birds in question being Mistle-Thrushes, and the more so because there were only two of them instead of a small flock." This was rebuff number two.

The latest date I recollect seeing Fieldfares staying in this country was on May 12th, 1879. On that morning I walked within gunshot of a cluster of five which were winging their way northwards, and had settled for a few moments on the top of a lofty poplar. With regard to the bird seen on Sept. 2nd, 1878, was it a pioneer of others to follow, or was it one that had been wounded and passed the summer with us? At all events, there seemed nothing wrong with its flight or general appearance when I was gazing at it.

I have found this species roosting in tall thick hedges, but generally on the ground, and frequently in the furrows in the open fields, for I have two or three times walked nearly on to the top of them after 10 p.m. on dark nights; they cannot even then resist a chuckle when thus disturbed. I think, though, the more common roosting-place is on the ground in small woods and plantations, and, after wheeling about for some time in a flock, first alighting on one tall tree and then taking a flight and settling on another, they will finally descend on the point of dusk to the lower trees,—ash-pole spinneys being especially favoured haunts at this hour. After resting for a few moments in the branches, the birds drop silently down in quick succession to the

shelter and concealment afforded by the brushwood and undergrowth, and so bivouac for the night. I have been reminded that Mr. Seebohm, in a most delightful chapter on the Fieldfare, writes:—"Instances are alleged of these birds having been flushed from the stubbles or the pastures at dusk; but this is the Fieldfare's feeding-hour; and if shrubberies be near at hand, it is there they spend the night." This is a decided expression of opinion, and comes from a great authority; but though Fieldfares may feed at dusk, a statement I venture to question, I doubt their doing so between the hours of ten and eleven at night, at which time, I repeat, I have often disturbed them from the open grass fields.

Nevertheless, it is one thing to detect the slips and question the statements of previous writers, to whom we all owe so much; quite another to write a book; and I can only trust that any criticisms of mine, wherever they may appear, will not be regarded as written in a captious, cavilling spirit. I am too well aware that many of my predecessors, in whose footsteps I am humbly and laboriously treading, have forgotten more than I can ever hope to know.

It is, of course, notorious that this species frequently breeds in large colonies. I have had its eggs from Norway, and was much struck by their resemblance to plain as well as handsome eggs of the Blackbird and the Ring-Ousel, with which, I should imagine, they may very easily be confounded at times by even expert oologists. Fieldfares have little knowledge of economy, otherwise they would better husband their resources in the matter of food supply. They will strip bushes of hips and haws in open weather when an insectivorous diet would prove equally sustaining, and then when a spell of frost and snow is over the country and there is nothing to be extracted from the fields, the produce of the hedges which has been prematurely attacked is liable to run short.

I have dwelt at some length on this species, as it is both well-known and a favourite. In short, what the Swallow is to the spring, the Fieldfare is to the autumn,—they each in turn serve to mark an epoch in time's revolving wheel.

The Blackbird (*Turdus merula*).

As a songster this species stands high in my regard, and, though the statement may be treated as open to question, I am not at all sure that every lover of birds is able to discriminate between its notes and those of the Song-Thrush. This, however, by the way. It breeds early in the spring, and yet in actual priority of date yields, to my thinking, to such well-known birds as the Mistle-Thrush, Song-Thrush, Long-tailed Tit, and one or two others. At all events, though there may be very little in it,—a distinction without much of a difference, perhaps,—I have noticed that the earliest nests which meet my eye as year succeeds year are never those of the Blackbird.

It would be superfluous to waste time on a discussion of the nidification of so common a species, for its nest and eggs fall an easy prey to every roving lad, while, in addition, there is scarcely a book on the birds of these islands which does not thoroughly deal with the question. Though the sites chosen for building purposes exhibit an infinite and varied assortment, there is an uniformity about the eggs which is sadly disappointing to the ornithologist, always on the look-out for abnormal coloured specimens. Nevertheless, I have on occasions taken some most richly-marked eggs, approximating to the handsomest type of those of the Ring-Ousel; and in two consecutive years at the same spot in the same hedge I found nests containing five and four eggs respectively, the bold markings of which I have never seen equalled, certainly not surpassed. I mention this case, however, as much with a view of drawing attention to how addicted most birds are to repairing year after year to the same haunts for rearing their young, as to show how the particular type of an egg laid by any species may be pretty confidently looked for again. Because I quote only a single instance, I am not generalising from it alone; I have had proof in plenty of what I say.

The unspotted variety of egg is, I believe, not uncommon, though I have only once met with it, and that was near to Mortimer's Cross, in Herefordshire, in the year 1888. The bird was on the nest, which was placed in a thorn-bush on the brink of the river Lugg; it contained four fresh eggs of a pale apple-

green colour, which I transferred without a pang to my collection, and which are frequently pointed at as "Starling's" when the contents of my cabinet are on view to friends and acquaintances. I believe it was Pope who wrote "A little knowledge is a dangerous thing," and I shall make bold to add, "especially where birds' eggs are concerned." My ill-success in not meeting with more specimens of this unspotted variety does not arise from slackness or laziness, as I never pass a Blackbird's nest without inspecting its contents. Boys who meditate purchasing the eggs of Fieldfares and Ring-Ousels will do well to be on their guard, as they bear a strong family likeness to those of the species under discussion.

Blackbirds are somewhat prone to rearing a second brood in the same nest, and I have known less than a week elapse between the departure of the young and the laying of fresh eggs. In the spring of 1883 a pair of these birds possessed themselves of a vacated Mistle-Thrush's nest for their second brood, and brought them off successfully. The earliest recorded date I have of an egg is March 16th, 1885.

Pied varieties are occasionally met with; my youngest brother shot a lovely bird at Plumtree, near Nottingham, the black and white feathers being most evenly apportioned. But, in this connection, it was my own star that was destined to be in the ascendant on Oct. 19th, 1893, on which date I was staying with my friend Captain Quintin Dick at Hinton St. George, in Somersetshire, he having taken Lord Poulett's extensive shootings thereabout on a lease. A strong contingent of us had just commenced warfare on the Partridges in a large field of turnips, when I espied a white bird skimming away over the tops of them in front of the "gun" on my left, who happened to be my host. I heard him say sharply to one of the keepers, "What the deuce is that?"; and, though simultaneously I fairly screamed "Shoot, shoot!" the bird was quickly out of range, and the responsive "bang, bang," came too late to be effective. As luck would have it, however, there were a brace of birds not picked when we reached the boundary hedge, for the turnips were of tremendous growth, and, as some little delay appeared inevitable, Capt. Dick very goodnaturedly let me go off in pursuit of this *rara avis*, an under-keeper accompanying me, as apparently my only chance of

securing a shot was to lie in ambush, and have it driven towards me. For half an hour it led us a pretty dance, and we repeatedly had to change our tactics; and, though I felt I did not want to set eyes on another Partridge until I had "bagged" my own particular bird, I must confess to feeling considerable qualms of conscience all the time as to what the rest of the "guns" would think of my desertion and apparent wild-goose—*alias*, white blackbird—chase. However, the end occasionally justifies the means, as it did in this instance; for, just as I was on the point of abandoning the pursuit as hopeless, the bird proving as averse to being driven as stalked, I chanced a snap-shot at what at the moment of firing I thought quite a prohibitive range, and down it came,—a prodigious fluke, yes, I freely admit,—a stray corn having severed its pinion-bone, and probably not another gone near it. A more beautiful bird of the kind I have never seen, and, though a similar specimen in the South Kensington Museum runs it hard, I prefer the one I was lucky enough to kill at Hinton St. George.

It is possible that someone or other will be found to blame me for what I have recorded in the light rather of a triumph—I deemed it one on the spur of the moment; but, though highly disapproving of the indiscriminate and senseless slaughter of rare species that might breed in greater numbers with us if left unmolested, I do not see that the capture of an abnormal-coloured Blackbird deserves reprobation, and especially when it was a marked bird, and the hand of almost every dweller in the district was against it. Indeed, considering the persecution it underwent, the wonder to me is that it managed to escape its doom for such a lengthened period. Had it been one of a pair of Golden Orioles nesting in the spring of the year in Kent, let us say, my action would have been most properly denounced as reprehensible in the highest degree. It is not after this manner, I have presence of mind enough to know, that the cause of Natural History is best aided. However, it is far from my intention to offer an elaborate apology for what I did, and should probably do again to-morrow if I had the opportunity; "collectors never know remorse, and seldom feel regret," and I am quite sure all my plunderings have not done one ten-thousandth part of the damage which a contrary wind inflicts at migration time.

The keeper on whose beat the white Blackbird was shot assured me that he had never seen it with a mate, and that he did not believe it had nested during the two years he had noticed it about the district. Such evidence as this is, of course, not conclusive on the point, though I think it extremely probable that his conjecture was right. Had it paired and assisted in the rearing of a brood, surely some of the young would have been abnormally marked, and, in this case, he would have observed them on his daily rounds. A young and intelligent gamekeeper would let very little escape his eye.

A word about pied Blackbirds, which, to my mind, are more subject to variations of plumage than any other species. I have seen it stated—I cannot say where, for I read pages and pages on the subject of birds almost daily—that the white feathers turn in time to black, and that even in the case of albinos nature in due course resumes her sway; the argument being that, if such were not the case, we should be continually meeting with abnormal-coloured species. Again, some other writer has recorded his conviction that albinos never revert to the normal plumage, and that natural white feathers always remain white; but that when resulting from disease they will resume the proper colours at the moulting period. The cause of preternatural plumage in birds need not be gone into here, but my impression is—once white or pied, almost always white or pied; while I view with some little incredulity the contention that disease is accountable for some of our pied birds, and that when they resume their normal health they also resume their ordinary plumage. What evidence is there in support of this? Surely it is more or less assumption? It is impossible to decide offhand about disease in a bird, especially when it is at large; while the few pied Blackbirds I have known kept in cages have never reverted to the normal colouring after moulting, although I have heard tell of an instance or two to the contrary. Of course, the obvious retort to this would be that none of them owed their white feathers to disease. So be it.

I have on a few occasions found six eggs in nests of this species, but five and four are more commonly met with, while it is quite the exception for a clutch to be represented by less than the last-named number.

There is one feature in the life-history of the Blackbird on which I have not commented, but to which I should like to just cursorily allude before bringing this particular sketch to a close. I refer to a tendency on the part of individual birds to indulge in mimicry; and though it has been very seldom indeed that I have without shadow of misgiving detected one uttering notes that were alien to the species, I met with a very noteworthy instance—quite recently in the Bala district—of a Blackbird copying the notes of a Curlew. The imitator sang from the same eminence on several consecutive afternoons during the month of May in 1895, and, though the reproduction of the borrowed tones was not so true to the original as that essayed by many a Starling in the same locality, it was impossible to close one's ears to the fact that for once in a way I had made the acquaintance of a Blackbird that not only took delight in mimicry, but modelled its refrain on the lines of that of which it had almost daily experience.

It may well be that the tuneful lay of the Blackbird is commenced at different seasons in different parts of the country,—I mean that the species will probably be heard in full song some days earlier in the spring of the year in a southern county like Hampshire, for instance, than in the more northerly regions of the British Islands. Considerations of this kind may not unnaturally be held to detract from the value of any given date respecting the first heard song of any particular species; but, as a comparative guide to my brother field-naturalists who take pleasure in noting the humblest details where birds are concerned, I may incidentally observe that I have never heard the Blackbird at the zenith of his musical powers in Leicestershire previously to February 20th, nor, I may add, the Chaffinch previously to February 19th. In this connection, however, much will obviously depend on the atmospheric conditions prevailing from year to year.

EARLY MAN IN BRITAIN.

SPURIOUS FLINT IMPLEMENTS.

By W. G. Clarke.

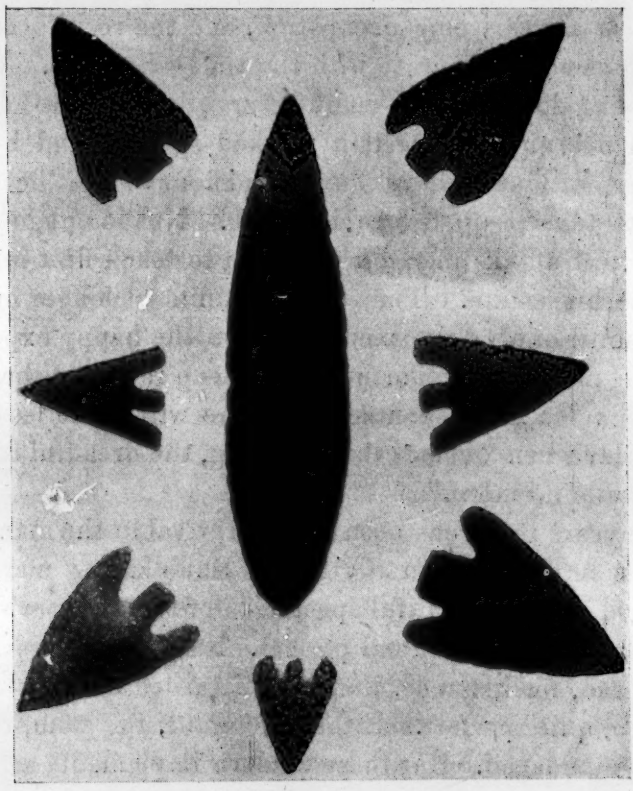
The making of spurious flint implements is an industry by no means confined to the last few years. Practically as soon as it was found that the evidences of man's handiwork from the river gravels of England had a marketable value, men skilled in flint-knapping began to make imitations of them, "Flint Jack" especially obtaining notoriety for the skill with which he imitated prehistoric weapons. At a meeting of the Norfolk and Norwich Archæologists' Society in 1861, Mr. Pengelly stated that he knew there were some clever people in the neighbourhood of Caistor who could make ancient flint knives. And when the Suffolk Institute of Archæology met at Thetford in 1866, one of the workmen excavating gravel told the members that if they but gave him a few days' notice prior to their next visit he could procure as many implements for them as they wished. Need one doubt that he looked for assistance to the skilled knappers at Brandon? The natives of East Anglia do not as a rule try to sell spurious bronze or iron weapons to the unsuspecting archæologist: they limit their operations to imitations of flint implements. Rusty horse-shoe nails have, however, been offered me as iron spear-heads; and an egg-spoon that had been buried about ten years relegated to the Lake-dwellers. But in these cases the false descriptions were made through ignorance, and not of deliberate purpose as is the case with many of those who sell spurious flint implements. The district is so noted, and is visited by so many archæologists in search of flint implements, that there are unrivalled opportunities of foisting off forged specimens as genuine antiques. The Brandon knappers, with their marvellous inherited skill and constant practice in making gunflints, turn out specimens of prehistoric arrow-heads

and axes that might deceive even the elect. It is probable that this little Suffolk town turns out more modern imitations of ancient flint implements than does all the rest of England. One collector, to prevent deception, made it a condition of purchase that he should himself see the finding of the implements. This was all very well; but anyone that has tried it knows that this searching is a wearisome occupation, and the results are by no means always commensurate with the time employed. What did the knappers do then but manufacture their arrow-heads, and bury them overnight in certain marked spots. And how could the worthy antiquary have any suspicions when he saw the implements turned up before his eyes. Not long ago a certain landowner in Suffolk offered a premium for each flint implement found upon his estate. They came in units at longer or shorter intervals, until one of the men hit upon the happy expedient of buying the modern implements at a cheap rate and then selling them to his master, a course which he will doubtless pursue until that day when "comes the reck'ning, the dreadful reck'ning, and men smile no more."

Of late years there has been quite a revival in the manufacture of spurious implements in north-west Suffolk, and undoubtedly those turned out are beautiful specimens of the knapper's art. In fact they are too beautiful and perfect. Rarely indeed do we find an arrow-head, for instance, that was discarded or lost thousands of years ago, quite perfect. Either the point, the stem, or one of the barbs is damaged. But these modern implements are mathematically correct, with never a chip in the wrong place. The friction of the sand and the action of the atmosphere always causes a polish on the ancient implements, and to effect this on the modern implements, which are somewhat dull on being first chipped, they are buried for some weeks in hot sand, and care is taken when they are removed to leave some of this adhering. And when you express doubts as to the genuineness of the implements, the vendors triumphantly point out the soil which still adheres. Polishing with rags is also one of the methods of imparting an antiquated appearance to a spurious implement, and the process is more rapid than that of the hot sand.

There is more often than not a middleman between the knapper and the collector. He obtains the name of the latter

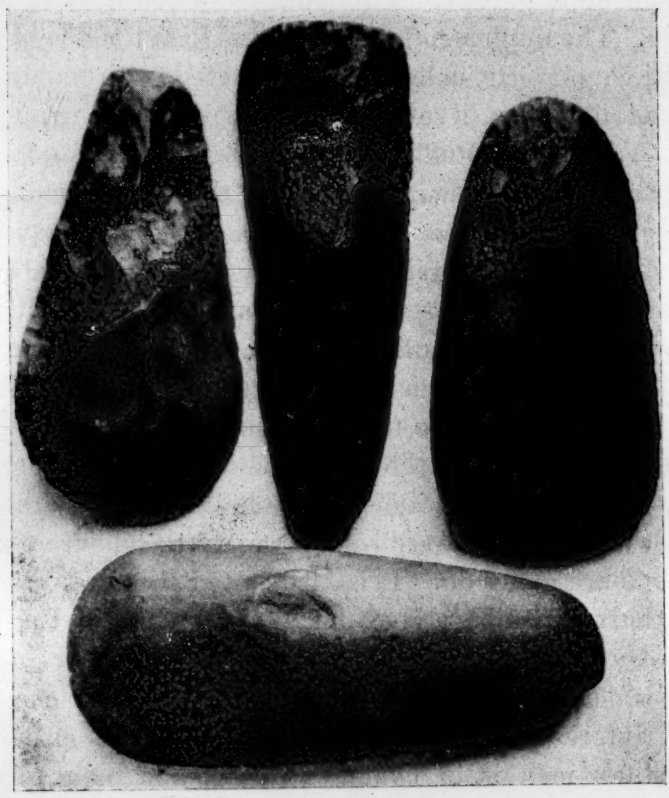
from some scientific directory, and offers to send some implements on approval. Some of them may be genuine; a few are almost bound to be spurious. If asked to guarantee the latter as genuine, the middleman will not do so, but will guarantee that they came from a certain town or village, the Suffolk men



Spurious Flint Arrow-heads.

working chiefly from Brandon, Lakenheath, Eriswell, and Mildenhall. From 5*s*. 6*d*. to half-a-crown is generally asked for these arrow-heads; but, should the archæologist know them to be forged, one shilling or even sixpence will be taken, which is by no means dear, when it is considered that oftentimes two or three hours' skilled labour is involved in their production. As many as ten varieties of spurious arrow-heads are made, the most common types being leaf-shaped and barbed, the latter forming an almost perfect equilateral triangle. The workmanship is, as a rule, extremely beautiful. Mr. Frank Norgate, of Bury St. Edmunds, has some splendid specimens which he himself made. A bluish-white

coating to denote age is sometimes obtained by boiling the implement for weeks in a kettle, and then polishing on a polishing wheel, of course removing the distinctive character of the ridges. The greater proportion of these arrow-heads are made of French flint, yellow and semitransparent.



Spurious Flint Axes: chipped ones of flint; unchipped, of plaster.

Scrapers are very rarely made. Genuine ones are so common in the district as to render imitations unprofitable. I have a spurious flint dagger in my possession, which would deceive none but the veriest novice. Chipped axes are, next to arrow-heads, the implements most frequently manufactured. As they command good prices and are somewhat difficult of detection, their disposal to enthusiastic and unsuspicious collectors is a remunerative calling. A spurious Neolithic axe of grey opaque flint, ground and polished, was offered to a friend of the writer by a Brandon workman. It was stated to have been found in a gravel pit at a depth of twenty feet! It is worthy of remembrance that gum is

of material assistance in making a good polished surface. Lanceolate knives, partaking more of the character of the Danish specimens, are also most successfully worked.

The latest development of the spurious implement trade, however, is probably that by which ground and polished Neolithic axes are made of plaster. The seat of this industry is somewhat uncertain. The implements are remarkably well made of a plaster composition, cleverly coloured and coated with gum, and are difficult of detection if one is unsuspicious. A request to the would-be vendor to be allowed to cut the article in question will generally elicit an indignant denial, and thus open the eyes of the purchaser. These plaster axes have been offered for sale in the Suffolk villages of Eriswell, Brandon, and Lakenheath. Glass arrow-heads may also be purchased at Brandon; but few collectors would view these otherwise than as modern curiosities; and it is doubtful if (as has been suggested) collectors could be found who would purchase them as American weapons.

I am also informed, although without personal experience of the fact, that Paleolithic implements and weapons are made in Stoke Newington, and passed round among the labourers wherever excavations are going on. It is also stated that even the British Museum authorities have been deceived by some of these implements, so perfectly are they made. As specimens of a modern industry which is fast dying out, these spurious implements have a certain interest; but their value in furthering our knowledge of prehistoric man is of course nothing, and collectors would therefore do well to be on their guard.

The writer must express his indebtedness to Mr. F. N. Haward, of Chelmsford, for some of the foregoing information.

VARYING FECUNDITY IN BIRDS.

By W. Storrs Fox, M.A.

In a very interesting article in the December number of 'The Zoologist,' Mr. Basil Davies attempts to explain why some species of birds lay more eggs than others. Personally I feel grateful to him for suggesting this enquiry, and for the reasons he assigns for the remarkable diversity in the number of eggs laid by different species. If, therefore, I criticise to some extent the theory which he propounds, I hope that it will be understood that I do so in no unfriendly spirit.

Mr. Davies compares the reproduction of birds and mammals. He says: "Birds feel it their duty not only to produce a certain number of offspring each year, but also to bring a certain number to maturity." To illustrate this he compares the Cat and the Nightingale. The former breeds at stated periods whether you destroy her offspring or not; but the latter *at once* prepares to produce a second brood if the first is destroyed. The truth is that the main object of every organism is to reproduce itself. Each species has its own method of bringing this about. The Cat provides for the peopling of the world by future Cats as thoroughly as the Nightingale provides against the extermination of its kind. These facts are familiar to us, but it is not easy to explain them. Under natural conditions the Indian Elephant does not become exterminated, nor the Brown Rat exceed certain limits. On the one hand, with the former the period of gestation is about nineteen months, and rarely is more than one produced at a birth (Roy. Nat. Hist. vol. ii. p. 536; Darwin estimated that though a pair might live to be one hundred years old, their offspring would probably average only six, 'Origin of Species,' 6th edit. p. 51); whereas the Rat bears "four or five times in the year from four to ten blind and naked young, which are in their turn able to breed at an age of about six months, the time of gestation being about twenty days" (Flower and Lydekker's

'Mammals,' p. 475). The immense number of eggs laid by some fish, and the amazingly rapid increase of some lowly animals, are well-known facts. Each species has its own place in nature, and produces sufficient offspring to keep that place filled. But how this is regulated is another matter. We are sure that individuals are quite unconscious and regardless of the requirements of their species. Probably the food-supply itself is the chief factor, increasing fertility in times of plenty, and checking it in times of scarcity.

With birds is it not mainly the food-supply which confines the breeding to a certain season? Can it be supposed that our insectivorous summer visitants usually nest only once in the season because they feel that the time for migration is approaching, and a second nest is therefore useless? I understand Mr. Davies to suggest this. These birds leave us partly because the supply of insect-food is running short, and partly because a mighty impulse drives them to go. But they cannot be *conscious* weeks beforehand that the time for their departure is drawing near. If Finches as a rule go in for a second family, I would suggest two possible reasons, though I do so with diffidence, for I feel that I have not sufficient data as evidence for them. (1) Do not our resident Finches as a rule begin to nest earlier than the migratory Warblers, and so get the start of them? (2) If the particular food needed for feeding young birds is decreasing, the parent Finches can provide their own sustenance in the form of seeds, and so they will not need to draw upon the insect-food to such an extent as Warblers. Moreover, young Finches soon become capable of digesting seed. Nature as a whole keeps those numbers under control.

I take the rules which Mr. Davies gives to amount to this:—Every individual does what it can to produce offspring, and to increase the number of its species. We can only suppose that it is quite unconscious of what it is doing.

Now, as to the number of eggs laid by Finches and Warblers. Mr. Davies gives five as the average clutch; and then proceeds to show why this is the only suitable number. I cannot agree with him that a hen of small size could not well lay more than five. As he himself states, Tits may lay very many more. It seems probable, however, that the number may be limited by the catering powers

of the parents, and certainly by the covering capabilities of the sitting hen. Mr. Davies allows that the food-supply may affect the parents, for he says that the number of eggs is often less when insect food is not abundant. And, again, he gives as a reason for the two broods of Finches, &c., that "it is necessary for them to produce eight or ten of their kind in a season to aid in killing off from the cultivated lands the vast swarms of insects to which the summer has given birth;" which means that where the supply of insects is great there will be plenty of birds to prey upon them. But this ought to apply equally to the Warblers, &c.

Mr. Davies proceeds to give reasons why in one family of birds the usual number of eggs laid by the species of that family is large; whereas in another family the reverse is true. With regard to Game Birds, he suggests that the large number of eggs is to meet a large amount of destruction. It seems to me that not only with Game Birds, but with all birds, this is the secret of a larger or smaller number of eggs. Darwin wrote: "The Fulmar Petrel lays but one egg, yet it is believed to be the most numerous bird in the world" ('Origin,' p. 52).* And I should suppose that the causes which controlled the average numbers of eggs of different species were—(1) the supply of food; (2) the number of enemies; (3) the power of self-defence or escape.

It is not possible to accept some of Mr. Davies' reasons. For instance, he supposes that the Nightjar lays two eggs, because several gaping young birds would be a conspicuous object. As they only gape after dusk, no number of them would be conspicuous. I know no object less conspicuous than a Nightjar covering its young or eggs.

Again, is not the reason for the single egg of the Guillemot to be looked for in the special defences of this bird rather than in the shape of the egg? No doubt this shape is a protection. If Guillemots' eggs were shaped like those of most birds, very few would be hatched. But the one egg is laid in a place of comparative safety, and the bird itself is quick on the wing and an apt diver, and for part of the year lives far from land, and so is probably less subject than most birds to attacks of foes.

* Mr. A. R. Wallace has thus modified this statement:—"The Fulmar Petrel exists in myriads at St. Kilda and other haunts of the species, yet it lays only one egg." ('Darwinism,' p. 30).

Though Pigeons only lay two eggs, they produce several broods in the year,

But the number of eggs in a clutch does not only vary in different families or different species, but in different individuals of the same species. This is clearly shown in books on birds, where a varying number of eggs is nearly always given in the account of a species. I take this variation to be the result of—(1) the abundance or otherwise of the food-supply; (2) the age of the hen. But there are curious local conditions which are difficult to explain. For instance, Mr. Howard Saunders, in his 'Manual,' gives the number of a Jackdaw's eggs as four to six. But years ago I was birdsnesting in East Yorkshire and found two Jackdaws' nests each containing seven eggs. Whereas in North Derbyshire I have examined numbers of their nests, and have never found more than four eggs or young birds in any one of them. Also in the same district, with one exception, I have always found four eggs as the clutch of the Dabchick; but in the 'Manual' the clutch is given as four to six.

A most interesting example of the effect of food-supply upon the number of eggs of individuals is be found in the official "Report on the Vole Plague in Scotland in 1889–1892." At that time the Short-eared Owl, which had hitherto been a rare breeding species there, became a common one, many of these birds laying ten to thirteen eggs; whereas six is the ordinary clutch. Moreover, in some cases there were second broods.*

Should Mr. Davies or others wish for another interesting study in connection with birds and their eggs, I am sure that they would find the meaning of colours an engrossing subject.

* No attempt is here made to discuss the relation of fertility to length of life. We are at present considering what are those factors which tend to limit or increase productiveness in birds. But length of life does not affect their egg-bearing powers; though the converse of this is probably true. Roughly, it may be said that the number of eggs laid by a species corresponds to the amount of destruction to which it is subjected. But it must be remembered that such destruction—by starvation, epidemics, or enemies—is more or less a fixed quantity, and therefore is not accidental so far as the species is concerned, though with regard to the individual it may seem to be so (*cf.* Weismann's 'Essay on the Duration of Life,' p. 11). If for a time more than the average numbers of a species are destroyed by enemies, the quantity of food per head will necessarily increase, and the birds of that species will become temporarily more fertile, as a result of more liberal feeding. But, should such additional destruction become a normal and permanent condition, it may be essential that the lives of the individuals of the species be prolonged, in order that the species may avoid extinction.

NOTES AND QUERIES.

MAMMALIA.

RODENTIA.

Climbing Powers of the Long-tailed Field Mouse.—During autumn and early winter Long-tailed Field Mice (*Mus sylvaticus*) eat the kernels of wild rose seeds in large numbers. To obtain the hips, the Mice climb among the briers, often travelling to the extremities of slender twigs in order to reach the fruit. The hips are nipped off with about a quarter of an inch of stalk attached, and if there be a bird's nest within easy reach are invariably taken to it. A search in the leafless hedgerows will result in the finding of many nests which the Mice have used. A Thrush's or Blackbird's is perhaps the favourite, but, failing this, a Hedge-Sparrow's or Greenfinch's, or even the fragile structure of a Whitethroat will serve. The Mice do not eat the fruit itself, but extract the seeds through a hole nibbled in the side, and, gnawing these with their chisel-like teeth, obtain the kernels. The empty seeds are left with the red pulp of the fruit, and I have seen piled up in a Thrush's nest as much of this *débris* as would fill a quart measure. In the neighbourhood of Alderley Edge I trapped several Long-tailed Field Mice in birds' nests last November—one of them in a Greenfinch's nest more than seven feet from the ground. The stomachs of those I examined were filled with a whitish mass of finely comminuted kernels, one containing in addition a small fragment of red fruit. It would appear that birds' nests are resorted to not merely on account of their convenient proximity to the growing fruit, for husks of acorns which must have been carried from the ground are sometimes present among the hips. A further reason may be that the Mice, when feeding in the nests, are comparatively secure from the attacks of their many enemies. — CHARLES OLDHAM (Alderley Edge).

AVES.

Flock of Crossbills at Yeovil, Somerset.—I received on Dec. 17th, from Mr. E. Little, gun manufacturer, of Yeovil, six Crossbills (*Loxia curvirostra*), shot from a large flock on Dec. 15th by a local farmer. Three of them were too much damaged to allow of preservation. — STANLEY LEWIS (Wells, Somerset).

Crossbill in North Wales. — Under date Dec. 7th, Mr. Arthur C. Parker forwarded an adult male of this species (*Loxia curvirostra*) from Bettws-y-coed for identification. He says "there are more cocks than hens, and the birds have now been hereabout three weeks." Subsequently Mr. Parker informed me the flock is only a small one, and that unfortunately many of its members have been wantonly destroyed. To the best of my knowledge, the last incursion of these birds in North Wales occurred in December, 1887; but a flock of them was seen in Delamere Forest, Cheshire, at the end of 1889. — ROBERT NEWSTEAD (Grosvenor Museum, Chester).

Nesting of the Goshawk in Yorkshire. — A beautiful fully adult female Goshawk (*Astur palumbarius*) has recently* been presented to the Norwich Castle Museum, which was shot at its nest a few days before the 13th of May, 1893, by Mr. W. M. Frank, a keeper on an estate at Westerdale, Grosmont, Yorkshire. Mr. Frank states that the nest, which contained four fresh eggs, was placed on the branch of a slender spruce-fir near the trunk, and about twenty feet from the ground. It was very large and flat, and the bird was very wild and difficult to get a shot at; he had to build a shelter of boughs to hide in, and enticed her by imitating her cry. Whether she had a mate, Mr. Frank is unable to state with certainty; he is under the impression that she had, but he did not see two birds together. Two of the eggs were sent to the Norwich Museum with the bird, but the other two are lost or broken. The Goshawk is in the present day one of the rarest of its family in eastern England, and in mature plumage so seldom met with that I only know of a single individual which has been procured in Norfolk, perhaps the county most favoured by its visits; and since the instance reported by Colonel Thornton, who received a nestling from the forest of Rothiemurchus "prior to 1804," I believe there is no authentic instance of its having bred in Great Britain, although it has been suspected of having done so. That this bird is not a more frequent visitor to this country is perhaps a matter of surprise, seeing that it is a common species in Central Europe, Germany, and Scandinavia, and there are still many apparently suitable localities for its nesting should it show an inclination to do so; but whether it would escape the attentions of the ubiquitous gamekeeper in such an event is very doubtful. Mr. Headley Noble, who was instrumental in bringing this interesting occurrence to light, suggests that the bird may have been an escaped trained Falcon, arguing from the facts that one bird only was seen, that the eggs were quite fresh, and that the bird was mutilated by the loss of a toe. As to the first suggestion, it has been stated by Mr. Frank that he was by no

* Note received Dec. 6th, 1898.—ED.

means certain that there was not a male bird—in fact, he remained till dark, after shooting the female, expecting its arrival, and spent the two following days in the wood with the same object, and suggests that the fact of there being several people working round the wood (a very small one) might have scared it away. As to the eggs being quite fresh, he says he did not allow the bird time to sit before shooting her. Mr. Noble's third reason—should the bird be an escape—may be of importance as a means of identification. The claw of one of the toes of the left foot is broken, which may have been done by shot, and the inner toe of the right foot is missing, evidently an old injury, as the stump is quite healed. Should such a bird have been missed about the time named, I hope this feature may recall it to the memory of its former owner. The question arises, would a trained Falcon, on obtaining its liberty, construct a nest and lay its complement of eggs unaccompanied by a mate? A female Goshawk has produced eggs in Mr. Gurney's aviary, but of course under circumstances which were not favourable to the construction of a nest. Prof. Newton, however, has called attention to a very interesting passage in Gairdner's edition of the 'Paston Letters' (see Lubbock's 'Fauna of Norfolk,' edition 1879, p. 225), which shows that these trained Falcons were so far sedentary in their habits that, provided the locality were suitable, a liberated bird might be expected to remain and nest. John Paston, writing to his brother in November, 1472, laments that a Goshawk sent him was so injured in transit that "she shall never serve but to lay egges." He therefore proposes to "cast hyr in Thorpe wood and a tarsell with hyr," that she might "eyer." This seems to indicate not only that the breeding of the Goshawk in the extensive woods which at that date surrounded the city of Norwich was not an unlooked-for event, but also, as Prof. Newton remarks, that the writer had some experience of a similar case; it will be noticed, however, that he proposed to supply her with a "tarsell."—THOMAS SOUTHWELL (Norwich).

Flamingo in Merionethshire.—Early in October last my brother, Mr. M. H. E. Haigh, wrote to me stating that, after a heavy gale from the south on the 26th and 27th of September, he had seen, on the 28th, a large bird on the estuary known as the "Traeth-bach," which, from his description, I had no doubt was a Flamingo (*Phœnicopterus roseus*). I was, however, unable to come down until the 20th of October, and on the following day succeeded in shooting the bird. It was excessively wild, rising, as a rule, nearly a quarter of a mile off, and flying round the estuary in large circles for quite twenty minutes each time it was put up. We finally got a shot at about ninenty yards with a heavy shoulder gun by allowing the boat to drift with the tide. It was in good condition, and showed no sign of

having been in captivity. The beak was flesh-coloured at the base and black at the point; eyes brownish yellow, legs and feet bright pink. After being skinned the carcase was examined by Mr. Cordeaux, who tells me that it was excessively fat. The stomach contained nothing but fine gravel; the bird was, however, shot very early in the morning. — C. H. Caton Haigh (Aber-iâ, Penrhyndeudraeth, Merionethshire, North Wales).

Scoters in South Hants (?).—Every Hampshire naturalist must have read with astonishment the statement made by Mr. Percival-Westell ('Zoologist,' 1898, p. 505) as regards Scoters (*Œdemia nigra*) being common in Hayling Island and the Isle of Wight "all the year round, so doubtless breed there." Indeed a "record" for Hampshire. But, alas! the writer gave away his case when he said they were called "Isle of Wight Parsons," for, as it is well known, that is the local name for the Common Cormorant (*Phalacrocorax carbo*). Moreover, the Scoter is a very rapid flying bird, and never "lazily wings" its way. We have the best authority for saying that the Scoter is very rarely—if ever—in the south of Hants in the summer, and we are doubtful whether there is any record of its breeding here.—Alec Goldney Headley (Portchester, Hants).

Nesting Habits of the Moorhen.—In the last number of 'The Zoologist' (1898, p. 506) there appears a note asking for the results of observations by other ornithologists of the nesting habits of *Gallinula chloropus*. In my own experience as a collector I never found the eggs of this species covered during the absence of the parent birds—in fact, in every case the eggs could be seen as soon as the nest was discovered. I remember a nest which I found in a small pit near here on April 29th, 1898, containing a full clutch of eggs. Although the eggs were boldly marked, and both nest and eggs perfectly visible from the bank, there was not the slightest attempt at concealment by covering them up. A few weeks later I came suddenly upon a pair of Moorhens in a small pit at Ashley, Cheshire. The birds, one of which I saw quite distinctly before it saw me, flew away, and I at once searched for the nest, which I found quite exposed on the opposite side of the pit to which I had seen the parent birds. As there were only two eggs in it, and not a full clutch, perhaps this latter instance does not furnish sufficient data on which to found an opinion; but I think other ornithologists will agree with me that at any rate in many cases the eggs of the Moorhen are left uncovered. — Graham Renshaw (Sale Bridge House, Sale, Manchester).

I notice in the last issue of 'The Zoologist,' 1898, p. 506, a note by Mr. Hewitt on the nidification of the Moorhen, and an invitation to field naturalists to confirm or otherwise whether the sitting bird covers the eggs on leaving the nest. At a small lake in a thickly wooded district near

Bath, by invitation, I spent a delightful May day in 1897 with this species. Having procured the assistance of the gamekeeper, I was rowed to where the rushes grew, and examined a dozen or more nests, nearly all containing eggs; one with four eggs in it, I remember distinctly, would have been difficult to find by anyone but an experienced ornithologist, on account of the eggs being almost hidden from view by the decayed portions of the rushes. They had without doubt been carefully concealed by the parent birds, and probably by the female after depositing her egg. This nest, or rather more than receptacle for the eggs, was situated on one of the fallen and collected masses of reeds, &c., in the centre of the lake, and had I asked my companion I do not think he could have pointed the exact spot where the eggs were. At the several nests around the never-failing springs in the neatly arranged gardens of the Bishop's Palace, Wells, I have never found the eggs concealed. As a brief summary, I conclude that until the full clutch of eggs is laid they may or may not be hidden, according to the abundance of Jays or Magpies in the neighbourhood; but after incubation has commenced it would be an exceptional case to find the eggs concealed, by reason that the sitting bird would not absent herself long enough from the nest to allow of the visitation of an egg-sucker, although I have, in company with the above-mentioned keeper, watched a Magpie for hours, perched immediately over a sitting Pheasant, waiting patiently until the time arrived for her to feed.—STANLEY LEWIS (Wells, Somerset).

Mr. Hewitt asks for the experience of others with regard to the Moorhen's nest. May I state that I have never seen any covering over the eggs of this bird, though I have found numbers of nests in my own and other counties? I see no suggestion of such a habit in 'Yarrell' or Howard Saunders's 'Manual.' But in Seebohm's 'History of British Birds' (vol. ii. p. 561) there is this statement:—"The Waterhen generally covers her eggs, when she leaves the nest, with pieces of surrounding vegetation."—W. STORRS FOX (St. Anselm's, Bakewell).

Little Bustard and Great Shearwater at Lowestoft.—Early in May, 1898, a male Little Bustard (*Otis tetrax*), in full summer plumage—a condition in which it is very rarely met with in this country, and the first instance known to me in the eastern counties—was killed at Kessingland, near Lowestoft, Suffolk. For obvious reasons the event was not made public till after the close-time had expired, when a photograph of the bird was sent to me. On the 14th November, 1898, the fresh skin of a Great Shearwater (*Puffinus major*), which had been brought in by one of the Lowestoft fishing boats, was sent for my inspection by Mr. Bunn of that town, who also had three live Storm Petrels about that time. Both the above-mentioned birds are now in a local collection.—THOMAS SOUTHWELL (Norwich).

Avocet in Dorset. — On Nov. 12th, 1898, I received from one of my collectors a fine female Avocet (*Recurvirostra avocetta*). The bird had been seen in the district for several days, but was exceedingly wild; it was, however, eventually secured during a foggy day.—E. Baylis (Birmingham).

Terns in the Isle of Man.—Referring to former notes (Zool. 1896, p. 471), I may mention that a dead bird found this season at the Tern colony there described, and which is still occupied, proved, on examination of the beak and wing, to be *Sterna arctica*. But an even more interesting discovery was that of the nesting of *Sterna minuta*, a species, I believe, never before recorded in Man. On 22nd June last I found a small colony of this bird on a sandy barren close to the coast; I saw two clutches of two eggs each, and again a single egg. All these were laid on the bare sand, with no lining whatever, and scarcely any perceptible nest hollow. Many stones were scattered over the ground; there was little vegetation, and that very small and scattered.—P. Ralfe (Castletown, Isle of Man).

Food of Grebes.—Two Sclavonian Grebes (*Podicipes auritus*, Linn.) have been sent to me this winter, and when mounting the last one, on Dec. 19th, I found in its stomach, in addition to the feathers and elytra of water-beetles that I discovered in the first specimen, numbers of caterpillars, which I sent on to a well-known entomologist, who kindly tells me that they are the larvæ of one of the Crane-flies, which are well known as the destructive grubs of the Daddy Longlegs, or Tommy Taylor, as it is called in parts of the county (*Tipula oleracea*). These Grebes have been by no means uncommon this winter, and were on a large expanse of inland flood-water, where I have had some good shooting with the lessee in single-handed punts with big guns, when the water has been out and Ducks abundant. I take it that, the meadows being flooded, the grubs which generally feed at the roots of grasses, &c., climbed up into the fences, bushes, or anywhere they could, and so were secured by the Grebes; for, good divers as they undoubtedly are, I scarcely think they would pull up the grass by the roots in twelve or fourteen feet of water to hunt for grubs. — Oxley Grabham (Chestnut House, Heworth, York).

NOTICES OF NEW BOOKS.

Colour in Nature, a Study in Biology. By MARION J. NEWBIGIN, D.Sc. (Lond.). John Murray.

THE colours of plants and animals, or rather their superficial colourations, have always attracted naturalists, generally exciting admiration, and sometimes provoking enquiry. In earlier days problems of this description were disposed of by the invocation of teleology, or the doctrine of design, which afforded no explanation, and simply demonstrated an unknown quantity. The Darwinian epoch introduced what may be called the Utilitarian Theory, by which animal colouration was controlled by "natural selection" for useful purposes in the struggle for existence. In each case design is implied, but in the one it is more or less a theological conception, while in the other it is represented as a natural factor. The result is that teleology has died a natural death, while the Utilitarian Theory has become rampant. The "simple primrose" which was "nothing more" to the amiable teleologist, has developed into the mighty Banian tree by the aid of current theory. We had almost forgotten that colour represented a physical or chemical process, in our estimation of its adaptive and protective nature.

The purpose of Miss Newbigin's book may be said to bring back the subject of colouration in nature to a technical treatment; to remove it from the domain of pure theory; to glance at it throughout the vegetable and animal kingdoms; and to describe its essence without either attempting to explain its purpose, or accepting some other very feasible and popular explanations now current. The differences between pigmental and structural colours are fully explained, and those colours classified. In the first, as is well known, hæmoglobin and chlorophyll play their great parts, while pigments, "which are definitely waste products, or are produced by the modification of waste products," are now

being seriously studied. When we remember the deadly effects of such "waste products" on the higher vertebrates, and that the yellow pigment found in the wings of many of the Pieridæ are due to "modifications of the ordinary waste products of the organism," we are forced with the authoress to suppose "that the wings of butterflies, being relatively non-vital parts, can have poisonous substances stored up in them without injury to the organism, and that therefore the utilisation of waste products as colouring agents can only occur in cases where the coloured structures are not intimately connected with the blood system."

The standpoint of this book is the physiological demonstration of animal colouration, the nature and elements of the colour itself, and not its evolutionary life-purposes. This treatment is neither sympathetic with, nor destructive to, the general conception of Protective resemblance and Mimicry. Colour alone must of course fall under the domain of Physiology and Chemistry, as, and in the same sense, all animal structure does, but this treatment does not explain its development in variety and markings; it only gives us its composites, and does not demonstrate its action as a force in the struggle for existence. In the last chapter, which is devoted to a discussion of "The relation of facts to theories," a rapid survey is given of the principal and perhaps most popular lines of modern speculation, and if Miss Newbigin has not come to bless, at all events most naturalists will agree with her concluding sentences: "..... in spite of the fluency with which so many people talk of the meaning of colour in organisms, the subject is as incomplete on the theoretical as on the physiological side. It seems reasonable to believe that the two deficiencies are related, and that a little more physiology will arm the theorists with better weapons. In the meantime, we cannot end a book on colour more fitly than by an appeal for more facts."

This volume contains many facts relating to animal colouration, and can be studied as well by a naturalist with a theory as by one who possesses it not. The bibliographical references at the end of the volume will assist a student of this fascinating subject.

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Flashlights on Nature. By GRANT ALLEN With 150 Illustrations by Frederick Enock. Geo. Newnes, Lim.

THIS book is a happy combination of the literary versatility of the author—too little remembered as the writer of 'The Colour-Sense,' — and of the conscientious illustrations of Mr. Enock, who as described by Mr. Grant Allen is "an enthusiastic and observant naturalist, who thinks nothing of sitting up all night if so he may catch a beetle's egg at the moment of hatching; and who will keep his eye to the microscope for twelve hours at a stretch, relieved only by occasional light refreshment in the shape of a sandwich, if so he may intercept some rare chrysalis at its moment of bursting," &c.

These sketches, or "flashlights," are written in the clear and easy style which is usually termed "popular," but which will well repay the perusal of "serious" readers. Under titles which smack of what is sometimes described as "sensational," we find that "a beast of prey" is no other than our old friend "the common garden spider," of which a very full and interesting account is given, and a female of which — "Rosalind"—was observed closely through the whole of a season. This spider was seen to attack and conquer wasps, a subject recently discussed in these pages. The doings of Shrikes are described as "A Woodland Tragedy," and in discussing the capricious character of their distribution in this country, our author accepts a now very general view, "that this relative frequency or scarcity depends upon the distribution of their proper food-insects." Indeed, just as we all know that "an army fights upon its stomach," so we are beginning to understand that "commissariat lies at the bottom of most problems of animal life."

It is a pleasure to meet with an interpreter of nature who can translate her record into plain and happy language, especially when there is so often a tendency to predicate profundity by obscurity; but Mr. Grant Allen's pen is sometimes almost too facile, and literary accomplishments run away with the unadorned natural facts. Thus we read, "In the soft slimy mud, the shoots of the curled pond-weed lie by during the frozen period, hearing the noise of the gliding skates above them"; the mandibles of a "mosquito-larva" are not too happily termed a "big moustache,"

nor are the antennæ of a mosquito more adequately represented as a "beard." But a few pleasantries do not detract from the general accuracy of the book, which throughout runs the danger of being too well written and too entertaining. Nor does the author of 'The Woman who Did,' fear the lash of pseudo-scientific jargon in being termed a "neo-Lamarckian" for writing "Use brings structure."

The illustrations are excellent and instructive. The book has neither a preface nor index. The first is a very small matter, but the second is bad for both book and author if future reference is desired.

Animals of To-day, their Life and Conversation. By C. J. Cornish. Seeley & Co. Lim.

"The following chapters were originally contributed to the 'Spectator,'" is the opening sentence of the preface to this book, and we are reminded of a remark made by Addison in the first paper to the older 'Spectator,' "I live in the world rather as a spectator of mankind, than as one of the species." Substitute "animal life" for "mankind," and we reach the plane of Mr. Cornish in this very interesting volume, the record of life-history being alone contemplated. The reprint of these weekly contributions in a complete form is very welcome, though we question whether they do not lose some of the original force as when they appeared singly, confined to one subject in moderate compass. Their reprint, however, clearly bears witness to what is now an undoubted fact, that the British reading public are at present thoroughly interested in the details of animal life.

Many facts which are supposed to be well known are here brought to light and emphasised. The Bactrian Camel "is a beast made to endure not heat but cold," as experienced Mongol herdsmen well know. The austere Goat is said, when city-kept in parts of New York, "to flourish on the paste-daubed paper of the advertisements which they nibble from the hoardings." As to the number of Cats in London, Mr. Cornish quotes a writer in the 'Daily Mail' for an estimate of 400,000. Mr. Hudson, however, in his 'Birds in London,' inclined to a much higher ratio in metropolitan feline population, believing in a probability

of nearly three-quarters of a million, and a certainty of not less than half a million London Cats. In an interesting, but to the zoologist melancholy article on "Wild beasts' skins in commerce," it is stated, as generally believed, "that the last of the Quaggas was killed years ago." This is probably a fact, but the writer, quite recently when in South Africa, was told by a very high authority that strange reports had been received on this subject from the Western Coast region. Is it too late to restore the Beaver to our streams? Mr. Cornish thinks not, and their presence need not be much dreaded. "Shallow streams they *dam;* and to make this dam they cut down trees and do mischief. But on deep, slow streams, such as the Thames, they make burrows in the bank and 'lodges,' but do not attempt to build dams, because the water is deep enough for their wants. All they need is enough willow-bark to feed on. If anyone would turn out a few Beavers on the Thames, and let them have the run of an osier-bed, they would probably increase and multiply."

There are sixteen illustrations. That of "Rob Roy's Cattle" is an artistic success.

Catalogue of the Syntomidæ in the Collection of the British Museum. By Sir Geo. F. Hampson, Bart. Published by the Trustees of the British Museum.

This is really the first volume of a most important publication, being nothing less than the commencement of a descriptive and analytical catalogue of the Moths of the World. The method is so clear and simple, and the wealth of illustration so ample, that any ordinary student cannot fail to identify, both generically and specifically, such species as he may desire to know, and in a classificatory sense understand; while to the entomologist the result of an exhaustive study, based on the comparison of nearly all available material, is a boon. Of course Sir George Hampson cannot expect that his proposed classification will be universally followed; that is a proposition which, however reasonable, is still an open question with most lepidopterists, but it is probable that the great use that must be made of these

volumes in the future, in the determination of genera and species, and the demarcation of families, will carry very largely the classification along at the same time.

This classification is distinctly based on evolutionary principles, depending almost entirely on wing structure. The author, as an evolutionist, makes himself clear. "The present families and genera are not of course derived from other existing ones, but from their ancestors; and when a family or genus is said to be derived from another, all that is meant is, that in order to reach their present stage of specialization, their ancestors must have passed through a stage which would in essential points of structure come within the definition of the other family or genus. And as a corollary, the plan of the book is "to begin with the most highly specialized families, genera, and species, and gradually work down to the most generalized forms."

The Syntomidæ, as treated in this volume, number 1184 *actually described* species, of which a very large proportion indeed is figured, generic characters pourtrayed, and full synonymy given. The last does not represent the mere useless occupation of a specialist as some theoretical writers incline to stigmatize. A zoologist is supposed to know the animal kingdom and its members under one and not various names. This promiscuity is not altogether unavoidable by workers residing in different centres of activity, and of course absent from one general collection of types. To assist this work, material has been lent and given from all sides, which, added to the immense and almost unique Heteroceral wealth now contained in the British Museum and in private collections in the country, makes the specific verdict of this volume one likely to provoke little "appeal." These books mark a very prominent aspect of our age in all departments. "The rich are getting richer"; in commerce the large undertakings are swallowing up the smaller ones; everywhere we see centralization as a necessity exerting its sway; and so in the technical zoology of the future it will be understood that only large national collections worked by State aid can give the last words in the zoological nomenclature which will be accepted as a canon, and liberate naturalists for other work. If we compare this and other catalogues with the encyclopædic work

which appeared in zoological literature towards the end of the last century, we may well take heart and fresh courage.

A separate issue of seventeen beautifully coloured plates accompany the volume for those who wish to acquire the same, and we trust that the author may have health and strength to finish the colossal undertaking. Meanwhile, as years must elapse before the whole of these volumes can be issued, it would be advantageous to the classificatory scheme of the author, and most useful to workers who would fall in line with the classification, if the names of existing genera under new family arrangements could be published elsewhere, and at an early date.

EDITORIAL GLEANINGS.

THE 'Zoological Record' for 1897 appeared last December. This invaluable *vade mecum* to all working zoologists is again a bulky volume, and bears witness to the vitality of our science. Only the record of Cœlenterata is held over, owing to the Recorder having left England at too early a period to have thoroughly completed his work. Mr. J. A. Thomson's record of "General Subjects" is again—apart from specialization—one of the most valuable annual contributions to Biology. It contains 784 titles, and is a guide to a year's philosophy of animal life. Perhaps the number of contributions gives at least the standard of activity during 1897. In Mammalia, Mr. Lydekker records 343 separate communications; in Aves, Dr. Bowdler Sharpe enumerates 567 distinct titles; Mr. Boulenger gives 242 referring to Reptilia and Batrachia, and 259 for Pisces. Tunicata has a small record; in Mollusca, Mr. Sykes gives 527 references, and in Brachiopoda 41. Passing the smaller work done in Bryozoa, we come to Crustacea, where Mr. A. W. Brown enumerates 208 contributions, 151 in Arachnida, and 65 in Myriopoda and Prototracheata. Insecta again heads the list with 1205 articles, as given by the Editor, Dr. D. Sharp. For Echinoderma (1896 and 1897), Mr. Bather enumerates 358 titles; in Vermes, Miss Buchanan gives 267. Prof. R. von Lendenfeld is able to contribute 42 for Spongiæ, and Mr. Brown 171 for Protozoa. As usual, a formidable list of names proposed for new genera and subgenera complete another volume of a well-thumbed series.

IN the Proc. of the United States Nat. Mus. vol. xxi. No. 1163, Mr. Frederick W. True has contributed a paper "On the Nomenclature of the Whalebone Whales of the Tenth Edition of Linnæus's 'Systema Naturæ.'" Seven European species of Whalebone Whales are now currently recognized; Linnæus described four species. Of these, *Balæna boops* is here considered as a synonym of *B. physalus*. The complete list of European Whalebone Whales is given as follows:—

1. *Balæna mysticetus*, Linnæus.
   The Bowhead, or Arctic Right Whale.
2. *Balæna glacialis*, Bonnaterre.
   The Black Whale, or Nordcaper.

3. *Balænoptera physalus* (Linnæus).
   The Common Finback or Rorqual.
4. *Balænoptera musculus* (Linnæus).
   The Blue Whale.
5. *Balænoptera borealis*, Lesson.
   Rudolphi's Rorqual.
6. *Balænoptera acuto-rostrata*, Lacépède.
   The Little Piked Whale, or Least Rorqual.
7. *Megaptera longimana* (Rudolphi).
   The Humpback.

Mr. R. Hedger Wallace has contributed a timely, lengthy, and well illustrated paper on "White Cattle: an Inquiry into their Origin and History," to the last part of the Trans. Nat. Hist. Soc. of Glasgow. These modern Park White Cattle are often described as descendants of *Bos primigenius*, and this opinion appears to be solely due to Prof. Rütimeyer; Mr. Wallace's contention, however, is that "they are simply the descendants of Roman cattle imported into the country during the Roman occupation." The evidence for this view is very amply given, and total agreement is pronounced with the conclusions of Prof. T. McKenny Hughes that we may take it as pretty well established that "the Urus characterizes the Neolithic age, having first appeared in Palæolithic times with the Bison, and having become extinct in Britain long before the Roman occupation. The Celtic Shorthorn appeared with the Urus in Neolithic times, lived down and through the Roman occupation, and thus may be regarded as the characteristic Ox of the Bronze age. The Romans improved the Celtic Shorthorn by crossing it with cattle imported from Italy; the form of the Roman Ox, as inferred from contemporary art, being exactly what was required to produce the modification observed in the latter Romanized breed. The characteristics of the Urus nowhere appear among the Romano-British cattle.

The Kerry Cattle are the most typical examples in the British Isles of the Celtic Shorthorn, while the Chillingham Cattle are the nearest representation of the breed introduced by the Romans.

The Highland and Welsh Cattle are derived largely from the Celtic Shorthorn, with more or less mixture of the Roman breed. All the above are whole-coloured or shaded.

The Longhorns, which appear nowhere with Romano-British or early mediæval remains, are the offspring of the large breeds imported from Holstein and the Low Countries in later mediæval times. All these, and the stock crossed with them, are apt to be parti-coloured or sheeted.

The Mediæval Shorthorn, as found in the ditches, &c., of the eleventh, twelfth, and thirteenth centuries, is a reversion to the numerically predomi-

nant native breed (Celtic Shorthorn) after the legionaries had been withdrawn, and selection and breeding had become impossible."

On Dec. 6th we received the following note from Mr. Rowland Ward:—"A few days ago a male specimen (adult) of the Golden Eagle was sent to me for preservation by Mr. S. Lewis, of Wells, Somerset. The bird had been trapped in the north of Scotland, and yielded the following measurements:—Wing, 25 in. in length; head to tip of tail, 32 in." This was subsequently published in 'The Field,' and the following note has also appeared on the subject:—"The Eagle mentioned by Mr. Tegetmeier in Saturday's 'Field' appears to have continued its peregrinations after its demise. It was sent from Scotland along with a couple of Buzzards to a Yorkshire natural history dealer, was offered to me, then sent down to Wells, in Somersetshire, and now appears to be finally reposing at Mr. Rowland Ward's. I did not see the bird.—Oxley Grabham."

We rejoice to read, in the January number of 'The Annals of Scottish Nat. Hist.,' of a proposed memorial to the late William Macgillivray, M.D., LL.D., who died in Aberdeen in September, 1852, and was buried in New Calton Burying-ground in Edinburgh. "To the present hour his grave is not marked even by an ordinary tombstone. There is nothing to indicate the spot save four low corner-stones, each bearing the letters 'W. M.'"

Some months ago a meeting was called of all who cherish the memory of Dr. Macgillivray, which resulted in the appointment of a Committee charged with the duty of issuing a circular to his surviving students and others likely to be interested in the proposal, collecting subscriptions, and erecting a memorial at his grave, any balance to be spent in commemorating him also in Marischal College.

It is proposed not only to erect a churchyard memorial—"simple if it would be in keeping with the character of the man to be commemorated," but also to found a Macgillivray Gold Medal in the University of Aberdeen, to be given as a prize to the best student in Zoology, Botany, or Geology; or to former students for the best original research work; or for the best series of specimens worthy of being placed in the Natural History Museum, or the Botanical Museum, of the University.

Subscriptions may be forwarded to the Rev. Dr. Farquharson, Selkirk, or to the Editors of the Ann. of Scottish Nat. Hist. Edinburgh.

Owing to the unique and extremely interesting nature of the fauna in Lake Tanganyika, the study of which was recently the object of an expedi-

tion, supported by the Royal Society, and led by Mr. J. E. S. Moore, a Committee has been formed, consisting of Sir John Kirk, Dr. P. L. Sclater, Mr. Thiselton-Dyer, Prof. Ray Lankester, and Mr. G. A. Boulenger, for the purpose of organizing another expedition to the same regions, to thoroughly survey the basin not only of Lake Tanganyika, but also the unknown portions of the northern extension of the great series of valleys in which Tanganyika, together with Lakes Kivu and the Albert Nyanza, lie; to collect specimens of the aquatic fauna and flora, and to study the geological history of this part of Africa. The latter object of the investigation should be of especial interest, for it was shown by Mr. Moore that almost without exception the shells of the singular series of whelk-like molluscs, captured by him in Tanganyika, are indistinguishable from those now found fossilized in Europe among the remains of old Jurassic seas. It would thus appear that at some remote period of time the great valley of Tanganyika was in connection with the sea, and that the strangely isolated marine fauna which still inhabits its slightly brackish waters has remained there ever since.—*Nature.*

THE effect of approaching storms upon song birds is the subject of an interesting contribution by Mr. C. E. Linney to the 'U. S. Monthly Weather Review.' It appears that during the night of Aug. 15–16th very severe electrical, wind, and rain storms prevailed over the northern district of Illinois. An observer in Henry County, Mr. W. W. Warner, noticed that for forty-eight hours before the storm not a sound was heard from the numerous song birds in the district. This observation was so full of interest that Mr. Linney wrote for additional information, with the result that he received numerous letters, some confirming it, others stating that birds sing louder and more persistently before a great storm, and nearly all agreeing that they are more restless than usual at such a time. Mr. Linney has found the following weather proverbs referring to song birds and storm:—When birds cease to sing, rain and thunder will probably occur. If birds in general pick their feathers, wash themselves, and fly to their nests, expect rain. Parrots and Canaries dress their feathers and are wakeful the evening before a storm. If the Peacock cries when he goes to roost, and indeed much at any time, it is a sign of rain. Long and loud singing of Robins in the morning denotes rain. Robins will perch on the topmost branches of trees and whistle when a storm is approaching. The restlessness of domestic animals and barn-yard fowls before an approaching storm is well known, and many of their peculiarities have been noted; but the actions of song birds do not appear to have previously received particular attention.—*Nature.*

THE Report of the Secretary of the United States Department of Agriculture for 1898 has come to hand. The excellent work done by this Institution is not confined to botanical subjects. "The Biological Survey is often called upon to determine the value of birds and animals to practical agriculture. It is in effect a court of appeal in which complaints are investigated concerning those species which are considered injurious to crops. A careful study is made of the food of useful and injurious birds and mammals, and thousands of stomachs of birds are examined in the laboratory. Two thousand three hundred and twenty-nine stomachs, mainly of Sparrows, Swallows, and Woodpeckers, were examined during the year. A report has been prepared on the native Cuckoos and Shrikes, and reports on Flycatchers and native Sparrows are in preparation. Several of the latter birds feed largely on weed-seed during the winter, and it is a matter of no little interest to determine how far they can aid the farmer in checking the increase of noxious weeds. The importance of this work is emphasized by the increasing demand made on the Department for information and publications on birds, in consequence of the recent widespread popular interest in ornithology."

THERE appears to be a considerable loss of avian life at Niagara Falls. The Rev. R. Ashington Bullen has contributed an interesting note on the subject to 'Science Gossip' for last December, from which we extract as follows:—"Through the kindness of Mr. David Boyle, Curator of the Archæological Museum, Toronto, Ontario, I have received the following list of birds which are washed over Niagara Falls. It has been compiled by Mr. Roderick Cameron, who has also added an account of how the birds are caught. The list, so far as I can ascertain, has never before been published:—Whistling Swans (*Cygnus americana*), Common Brent-geese (*Bernicla brenta*, Stephens), Canada Goose (*B. canadensis*, Boie), Mallard Ducks (*Anas boschas*, Linn.), Pintail Ducks (*Dafila acuta*, Jenyns), American Wigeon (*Mareca americana*, Stephens), American Green-winged Teal (*Nettion carolinensis*, Baird), and other varieties, American Eider-duck (*Somateria spectabilis* Leach), American Black-scoter or Sea-coot (*Pelionetta perspicillata*, Kaup), American White Pelican (*Pelecanus tachyrhynchus*), Shoveller, or Spoonbill Duck (*Spatula clypeata*, Boie), Grey Duck, or Gadwall (*Chaulelasmus streperus*, Gray), Black Dusky-duck (*Anas obscura*, Gmelin), Wood-duck (*Aix sponsa*, Boie), Canvas-back Duck (*Aythya vallisneria*, Bonaparte), Red-head Duck (*A. americana*, Bonaparte), Blue-billed Duck, or Scaup (*Fulix marila*, Baird), Whistle-wing Duck (*Bucephala americana*, Baird), Golden-eye Duck (*B. islandica*, Baird), Buffle-head or Butter-ball Duck (*B. albeola*, Baird), Eider or Spectacled Duck (*Somateria spectabilis*, Leach), Scoter or Surf Duck (*Oidemia americana*, Swainson),

Saw-billed Duck (two), (*Fulica americana*, Gmelin), and Mud-hens (*Rallus crepitans*, Gmelin), Sheldrake (*Mergus americanus*, Cassin), Red-breasted Merganser (*M. serrator*, Linn.), Hooded Merganser (*Lophodytes cucullatus*, Reichart), Common Cormorant (*Graculus carbo*, Gray), Ruddy Duck (*Erismatura rubida*, Bonaparte), Summer Duck (two), Coween Duck (three), Great Northern Diver, or Loon (*Colymbus torquatus*, Brunnich), Muffle-head Diver (*C. arcticus*). The scientific names are mainly taken from Samuels's 'Birds of New England and Neighbouring States.'"

At the meeting of the Zoological Society, on Nov. 29th, the disputed classificatory position of an interesting animal was considered, when Mr. F. G. Parsons, F.Z.S., read a paper on the anatomy of adult and fœtal specimens of the Cape Jumping Hare (*Pedetes caffer*). In it the different systems—osseous, muscular, nervous, circulatory, digestive, &c.—were described in some detail, and contrasted with the corresponding parts in two Jerboas (*Dipus hirtipes* and *D. jerboa*). The author regarded the muscular system as furnishing the best clue to the position of the animal, and, considering all the evidence in his possession, looked upon *Pedetes* as being nearly akin to the Jerboas; but thought that, if a sharp line had to be drawn anywhere between the Mouse-like and Porcupine-like rodents, *Pedetes* should be placed on the hystricomorphine, and the *Dipodidæ* on the myomorphine side of that line. The radial ossicle in the carpus, described by Bardeleben as a præpollex, was found to answer accurately to that writer's description; but Mr. Parsons failed to find any proof which satisfied him of its digital nature.

At another meeting of the above Society, held on Dec. 13th, a communication was read from Mr. H. H. Brindley, on certain characters of the reproduced appendages in the Arthropoda, particularly in the *Blattidæ*. It was a continuation of a paper published in the 'Proceedings' of the Society for 1897 (p. 903), and contained observations on the process of regeneration of the legs in the *Blattidæ*. Some review of our knowledge of the regeneration of appendages in other Arthropods was attempted, from which it appeared that while certain appendages in certain groups when regenerated were always apparently exact replicas of the normal, in other cases, besides the legs of *Blattidæ*, regenerated appendages invariably differed from the normal in such constant respects that they should be regarded as alternate "normals" rather than as imperfect reproductions of the congenital normal structures. In the case investigated in detail there was evidence that the process of ecdysis involved reconstruction of the soft parts as well as of the cuticle of the appendage.

The 'South Australian Registrar' complains of the wanton destruction of birds there, stating that it is an unforeseen effect of the legislation intended to ensure the destruction of Sparrows and other feathered pests; but it goes on to say that to the ruthless and indiscriminate extermination of birds which is now proceeding in almost every district some material check might be applied if Parliament would only spare an hour or two of its valuable time for the consideration of the Bill promoted by the Society for the Protection of Birds. When that Society was inaugurated four years ago many people described the movement as an evanescent fad which would have no result, but the local branch has now 525 members, and the parent society in the old country numbers 16,200. South Australia is apparently now concerned about the fate of the native birds, and it has good reason to be, not only from a sentimental, but also from a utilitarian point of view. In many ways different species of Australian birds may prove themselves to be the friends of mankind. Kendall, the most essentially Australian of all our poets, mentions not the best of these when he says—

"Welcome as waters unkissed by the summers
Are the voices of Bell-birds to thirsty far-comers."

But if only on the ground of pure sentiment, the agitation undertaken by the Society is fully justified. The days are surely gone by when in any civilized country a large proportion of the people, even in the needful work of extirpating pests, would wantonly prefer the cruel methods of slow torture to those of swift and painless destruction. No doubt one may find here and there wretches who would sit smoking a pipe and watching the struggles of a wounded bird without the slightest impulse to put it out of its misery. Some boys will actually pull the wings and the legs away from a living bird, and impale the suffering little thing against the trunk of a tree, in order to enjoy the spectacle of its agony. The practice of offering bonuses for the heads of Sparrows undoubtedly tended to harden the consciences of many young people, and the amount of wanton cruelty observed in the park-lands around Adelaide is quite disquieting. Unfortunately, the existing demand for wings for the trimming of ladies' hats leads to an immense amount of cruelty, and the boys therefore are not the sole persons responsible for the evil. In the case of those species of birds that are already in danger of extermination, the caprices of fashion are peculiarly unpatriotic and unwise, as well as cruel, for they perpetrate their worst ravages at the breeding season, when the plumage is at its brightest.—*Globe*.

Some interesting facts are to be found in 'Angling Notes' contributed to the 'Westminster Gazette' of Dec. 30th. In connection with the details of a plan to increase the stock of Salmon in the Tweed and Teviot,

we read:—A hundred years ago, we are told, lands were not so well cultivated and drained as they are to-day. Then, when the rains came, the mosses soaked up the water, which formed itself into shallow lochs and pools. These gave out their contents slowly and gradually, and when the rivers were flooded they ran full for a long time. Now all this is changed. The hills are well drained, as well as all lands available for cultivation; and when the rain falls heavily the water rushes off at once to the rivers, which rise with wonderful rapidity, and then rush off with tremendous violence to the sea, tearing up the gravel, often altering its channel, and damaging the banks. The subsidence of the flood is as rapid as its rise. The damage which is done to the ova of Salmon when a flood of this nature occurs during or immediately following upon the spawning season, will be apparent to anyone. We have often seen whole banks of gravel washed away during such times, and of course, where these have been used for spawning-beds by the Salmon, the chances are that the greater proportion of the ova or undeveloped fry will be silted over and destroyed. The establishment of sufficiently large hatcheries where the ova and fry would be protected until the latter had reached a suitable age for returning into the river would counteract to a great extent these many adverse influences.

According to a note in a late issue of the 'Daily Chronicle,' the recent practice of feeding the Lion in the Lincoln Park Zoo, in Chicago, with live Dogs has created something of a disturbance, the President of the Humane Society denouncing the practice, even though this method of feeding has been undertaken from a medical point of view. The Lion which has been thus fed is a big African specimen, which is afflicted with rickets, due, it is believed, to improper diet. During the past ten years twenty-seven African Lions, representing a loss of more than £2000, have died in this way, although hitherto the disease has been diagnosed as paralysis, and it is in the hope of preventing further loss that the Dogs, which were taken from the pound, were given to the Lion for food.

The death of Mr. Christopher Sykes took place on Dec. 15th. This gentleman will not alone be remembered as the "grave young man of 'Lothair,'" and the friend of Princes, but, by British ornithologists, as one to whose untiring exertions we owe the Sea Birds' Protection Act.

After a successful career of over thirty years, 'Science Gossip,' the favourite journal for amateurs devoted to Natural, Physical, and Applied Sciences, has just entered upon independent offices at 110, Strand. The editorial management is still under the control of Mr. John T. Carrington, assisted by Miss F. Winstone.

A VERY good set of the first five editions of Walton's 'Compleat Angler' came up for sale on December 1st at Messrs. Sotherby's, among the choice library of books on angling formed by the late Mr. Edward Snow, of Boston, Mass., U.S.A. These five editions were those which appeared during the lifetime of Izaak Walton, and the Snow copies are uniformly bound in olive morocco extra by F. Bedford. The set was knocked down to Messrs. Pickering and Chatto for £235. The Ashburnham set, unique as regards size and condition, realized £800 in May last, and some of the volumes possessed the further sentimental advantage of having the author's autograph notes written in them. The Snow copies were slightly "shaved" in some places, and some of the leaves in the first issue were defective, and the entire set was sold "not subject to return." A second copy of the second edition of the same work, with many of the headlines cut into, brought £19 15s., and three other copies of the third edition respectively sold for £12 10s., £35, and £11. Other angling books included an imperfect copy of 'The Secrets of Angling,' by John Dennys, 1652, £36. The total of the sale of 669 lots amounted to £1280.

MR. F. T. MOTT, of Crescent House, Leicester, has reprinted in pamphlet form two papers expressing his theories on the "Origin of Organic Colour," which were respectively contributed to 'Science,' and read at the Nottingham Meeting of the British Association in 1893. Mr. Mott predicates a "great concentrating wave of organic life in its progress towards an unknown climateric," as a result of which "the beauty of summer as we know it now, though it has never been paralleled in the past, will be as nothing to the blaze of brilliance which shall mark the summers of the future." "In the animal world brilliant colour is still comparatively rare, this branch of the organic wave being perhaps less advanced than that which rules the department of vegetation."